

What is Claimed is:

1. A unilimb breathing circuit comprising
a proximal end coupling member
a distal end coupling member
a corrugated expiratory tube having a first end coupled to the proximal end coupling member, and a second end coupled to the distal end coupling member, the expiratory tube being expandable between a fully compressed rest position and a fully expanded rest position, and having a plurality of intermediate rest positions wherein the expiratory tube is capable of maintaining its rest length without the exertion of an external force, and
an inspiratory tube having a first end coupled to the proximal coupling member, and a second end coupled to the distal end coupling member, the inspiratory tube being expandable between a fully compressed position and a fully expanded position, and having a plurality of intermediate rest positions wherein the inspiratory tube is capable of maintaining its rest length without the exertion of an external force,
wherein the length of the inspiratory tube is greater than the length of the expiratory tube.
2. The unilimb breathing circuit of claim 1 wherein the length of the inspiratory tube is between about 1 and 7 inches when each of the inspiratory and expiratory tubes are in their fully expanded positions.
3. The unilimb breathing circuit of claim 1 wherein the length of the inspiratory tube is between about 3 and 5 inches greater than the length of the expiratory tube.

4. A unilimb breathing circuit comprising

- a proximal end coupling member having an axis
- a distal end coupling member having an axis
- a corrugated expiratory tube having a first end coupled to the proximal end coupling member, and a second end coupled to the distal end coupling member, the expiratory tube being expandable between a fully compressed rest position and a fully expanded rest position, and having a plurality of intermediate rest positions wherein the expiratory tube is capable of maintaining its rest length without the exertion of an external force, and
- an inspiratory tube having a first end coupled to the proximal end coupling member, and a second end coupled to the distal end coupling member, the inspiratory tube being expandable between a fully compressed position and a fully expanded position, and having a plurality of intermediate rest positions wherein the inspiratory tube is capable of maintaining its rest length without the exertion of an external force,
- wherein the distal end coupling member includes an axis containing terminus for receiving the inspiratory tube, the axis of the terminus being radially offset from the axis of the distal end coupling member.

5. A unilimb breathing circuit comprising

- a proximal end coupling member
- a distal end coupling member
- a corrugated expiratory tube having a first end coupled to the proximal end coupling member, a second end coupled to the distal end coupling member, an inner diameter and an

outer diameter, the expiratory tube being expandable between a fully compressed rest position and a fully expanded rest position, and having a plurality of intermediate rest positions wherein the expiratory tube is capable of maintaining its rest length without the exertion of an external force, and

an inspiratory tube having a first end coupled to the proximal end coupling member, a second end coupled to the distal end coupling member, an inner diameter and an outer diameter, the inspiratory tube being expandable between a fully compressed position and a fully expanded position, and having a plurality of intermediate rest positions wherein the inspiratory tube is capable of maintaining its rest length without the exertion of an external force,

wherein the ratio of the outer diameter of the inspiratory tube to the inner diameter of the expiratory tube is sized to minimize flow resistance therebetween, while facilitating generally linear compressibility and expandability of the inspiratory and expiratory tubes.

6. The unilimb breathing circuit of claim 5 wherein flow resistance of the breathing circuit is such that at 60 liters/minute of flow, the pressure drop across the circuit is no more than about 5 cm of water.
7. The unilimb breathing circuit of claim 5 wherein the ratio of the outer diameter of the inspiratory tube to the inner diameter of the expiratory tube is between about 0.65 and 0.85.
8. The unilimb breathing circuit of claim 7 wherein the ratio of the outer diameter of the

inspiratory tube to the inner diameter of the expiratory tube is between about 0.70 and 0.80.

9. The unilimb breathing circuit of claim 5 wherein the ratio of the outer diameter of the inspiratory tube to the inner diameter of the expiratory tube is about 0.75.
10. The unilimb breathing circuit of claim 7 wherein the size difference between the outer diameter of the inspiratory tube and the inner diameter of the expiratory tube is between about 0.25 and 0.29 inches.